



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/141,443	08/27/1998	AHMAD (NMI) WALEH	D-95013A	9862

7590

01/14/2003

DAIVD W COLLINS
75 WEST CALLE DE LAS TIENDAS SUITE 125B
GREEN VALLEY, AZ 85614

EXAMINER

MARKOFF, ALEXANDER

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 01/14/2003

20

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/141,443

Applicant(s)

WALEH ET AL.

Examiner

Alexander Markoff

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-23 and 25-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-23 and 25-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- ☐ Interview Summary (PTO-413) Paper No(s). _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-23 and 25-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are indefinite or/and incomplete because it is not clear how the coatings, films, layers or residues can be subjected to a post-rinse treatment when they have already been altered and removed in the previous steps.

The similar deficiency is additionally presented in some dependent claims, such as claim 25, which require additional steps applied to the coatings, films, layers or residues after they already been altered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1746

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3-23 and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al (US Patent No 5,037,506) in view of Hawley's Condensed Chemical Dictionary, in view of Mayer et al (US Patent No 3,893,869) and further in view of Nachshon (US Patent No 5,114,834), Engelsberg (Laser-Assisted Cleaning Proves Promising), WO 97/17164, WO 95/07152, Engelsberg (US Patent No 5,024,968) and Engelsberg et al (US Patents No 5,643,472 and 5,531,857).

Gupta et al teach a method substantially the same as claimed except for the last laser cleaning step.

Art Unit: 1746

However, a precise cleaning and photoresists removal by lasers was conventional in the art as evidenced by Engelsberg, Engelsberg et al, WO 97/17164, WO 95/07152 and Nachshon.

It would have been obvious to an ordinary artisan at the time the invention was made to use laser processing in the process of Gupta et al after the solvent rinse with reasonable expectation of adequate results to more completely remove contamination from the surface of the wafer because the prior art teaches this step as a conventional and desirable.

It is noted that Gupta et al do not explicitly state that nitrous oxide is presented during UV treatment.

However, this gas is part of the air. See Hawley's Dictionary as an evidence. Thereby, the claimed gas would be obviously presented.

Gupta et al do not specifically teach the use of ultrasonic-megasonic during the solvent treatment.

However, the use of ultrasonic-megasonic during liquid treatment of semiconductor wafer was notoriously well-known and conventional in the art. See at least Mayer et al.

It would have been obvious to an ordinary artisan at the time the invention was made to use ultrasonic-megasonic during the solvent treatment in the modified method of Gupta et al in order to enhance the contamination removal with reasonable expectation of adequate results because this was conventional in the industry way to enhance the treatment.

Response to Arguments

7. Applicant's arguments filed 10/24/02 have been fully considered but they are not persuasive.

With respect to the rejection made under 35 USC 112(2) the applicants argue that the claimed limitation of removing not removed or altered coatings, films, layers or residues is supported by the specification.

It is noted, that in contrast to the applicants statement the cited part of the specification does not support the claimed limitation. The cited part only teach removing of a residual organic material which is left after the rinse step.

There is no recitation of removing not- altered coatings, films, layers or residues.

As to the rejection of the claims under 35 USC 103 (a):

The applicants argue that only two steps of exposure to sulfur trioxide and rinsing is disclosed by Gupta et al.

This is not persuasive. Gupta et al also disclosed exposure to UV radiation prior to exposure to sulfur trioxide. See at least column 6, lines 35-41.

The applicants argue that the combination of the applied references is not proper because Gupta et al teach the complete removal of the photoresists. This is not persuasive because not in all cases the photoresists were completely removed by single steps of exposure to sulfur trioxide and rinsing. See at least column 6, lines 16-18.

The applicants also argue that the concentration of nitrous oxide in the air is low.

This is not persuasive because the claims are not limited to any specific concentration of the nitrous oxide.

The applicants argue that there is no suggestion in the art to use ultrasonic cleaning in conjunction with a sulfur trioxide cleaning.

This is not persuasive because the use of ultrasonic to enhance the efficiency of the rinse cleaning was notoriously well-known in the art. It would have been obvious to an ordinary artisan at the time the invention was made to use ultrasonic-megasonic during the solvent treatment in the modified method of Gupta et al in order to enhance the contamination removal with reasonable expectation of adequate results.

The applicants further argue that they recognized that sulfur trioxide and rinsing would not necessarily completely remove hardened photoresist.

The examiner would like to note that that was previously shown by Gupta et al.

The applicants also argue that the examiner fail to cite references that disclose or suggest pretreatment and post treatment with combination with sulfur trioxide cleaning.

The examiner disagrees. Gupta et al in contrast to the applicants statement disclose the claimed pretreatment step. The examiner in contrast to the applicants statement cited references to show that the claimed post treatment was conventional in the art and provide motivation to include such step in the method of Gupta et al.

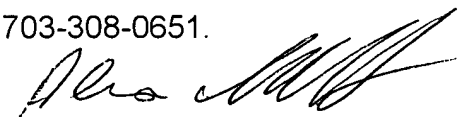
Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Markoff whose telephone number is 703-308-7545. The examiner can normally be reached on Monday - Friday 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on 703-308-4333. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.


Alexander Markoff
Primary Examiner
Art Unit 1746

am
January 12, 2003

ALEXANDER MARKOFF
PRIMARY EXAMINER